Stoller
Grand Junction Office established 1959

GJO-2004-587-TAC

C4236
Log Data Report

Borehole Information:

Borehole: C4236			**Site:** North of ERDF		
Coordinates (WA State Plane)		**GWL (ft)[1]:** 285.2 (TOC)		**GWL Date:** 02/04	
North	**East**	**Drill Date**	**TOC[2] Elevation**	**Total Depth (ft)**	**Type**
N/A[3]	N/A	Feb. 2004	N/A	409	Becker

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	2.0	6 1/4	6	0.12	0	409
Threaded steel	1.5	9	8	1/2	0	409
The logging engineer measured the casing stickup using a steel tape. The casing thicknesses for both the 6- and 8-in. casings are from a memorandum written by R. McCain dated July 9, 2003.						

Borehole Notes:

Zero reference is the ground surface. This borehole was logged through the drill pipe. Groundwater level was measured using an acoustic well probe from top-of-casing.

The Becker drilling system uses a dual-wall casing. Air flows down the annulus and cuttings are returned inside the inner casing. Total wall thickness is 0.620 in., increasing to 1.115 in. at the casing joints, which occur at 10-ft intervals.

Logging Equipment Information:

Logging System:	Gamma 1E		**Type:** 70% HPGe (34-TP40587A)
Calibration Date:	01/2004	**Calibration Reference:**	GJO-2004-568-TAC
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0

Gross Gamma Logging System (GGLS) Log Run Information:

Log Run	1	2	3 Repeat	4
Date	02/09/04	02/09/04	02/10/04	02/11/04
Logging Engineer	Spatz	Spatz	Spatz	Spatz
Start Depth (ft)	410.0	186.0	179.0	137.5
Finish Depth (ft)	185.0	138.0	138.0	0.5
Count Time (sec)	n/a[4]	n/a	n/a	n/a
Live/Real	R	R	R	R
Shield (Y/N)	N	N	N	N
Sample Interval	0.5 ft	0.5 ft	0.5 ft	0.5 ft
MSA Interval (ft)	N/A	N/A	N/A	N/A
ft/min	1.0	1.0	1.0	1.0

Log Run	1	2	3 Repeat	4
Pre-Verification	AE080CAB	AE080CAB	AE081CAB	AE081CAB
Start File	AE080000	AE080451	AE081000	AE081083
Finish File	AE080450	AE080547	AE081082	AE081357
Post-Verification	AE080CAA	AE080CAA	AE081CAA	AE081CAA
Depth Return Error (in.)	n/a	-1	n/a	-3
Comments	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.

Logging Operation Notes:

The borehole was logged through drill pipe. Logging through the drill pipe used in the construction of this borehole precludes the acquisition of spectral gamma log spectra that have consistent statistically valid photopeaks.

Gross gamma data were collected using Gamma 1E. Pre- and post-survey verification measurements employed the Amersham KUT (^{40}K, ^{238}U, and ^{232}Th) verifier with serial number 118. Logging was performed with a centralizer installed on the sonde. Zero reference was the ground surface. Maximum logging depth achieved was 410 ft.

Analysis Notes:

Analyst:	Henwood	Date:	02/18/04	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verification spectra were collected at the beginning and end of each day and compared. The total gamma counts were within 2 percent.

Log spectra were processed in batch mode using APTEC SUPERVISOR to determine gross counts, and count rates were calculated in EXCEL. Zero reference was the ground surface. Water and dead time corrections were not applied to the data. The influence of the thick casing joints is apparent on the total gamma where reduced count rates are exhibited at approximately 10-ft depth intervals.

Log Plot Notes:

Log plots are provided for gross gamma counts per second. A plot of the repeat log versus the original log is included.

Results and Interpretations:

Reduced count rate is observed at the groundwater level of approximately 287 ft. A decrease in gamma activity occurs at each casing joint, where the increase in wall thickness results in greater attenuation of gamma activity.

The plots of the repeat logs demonstrate reasonable repeatability of the gross gamma logging system (GGLS).

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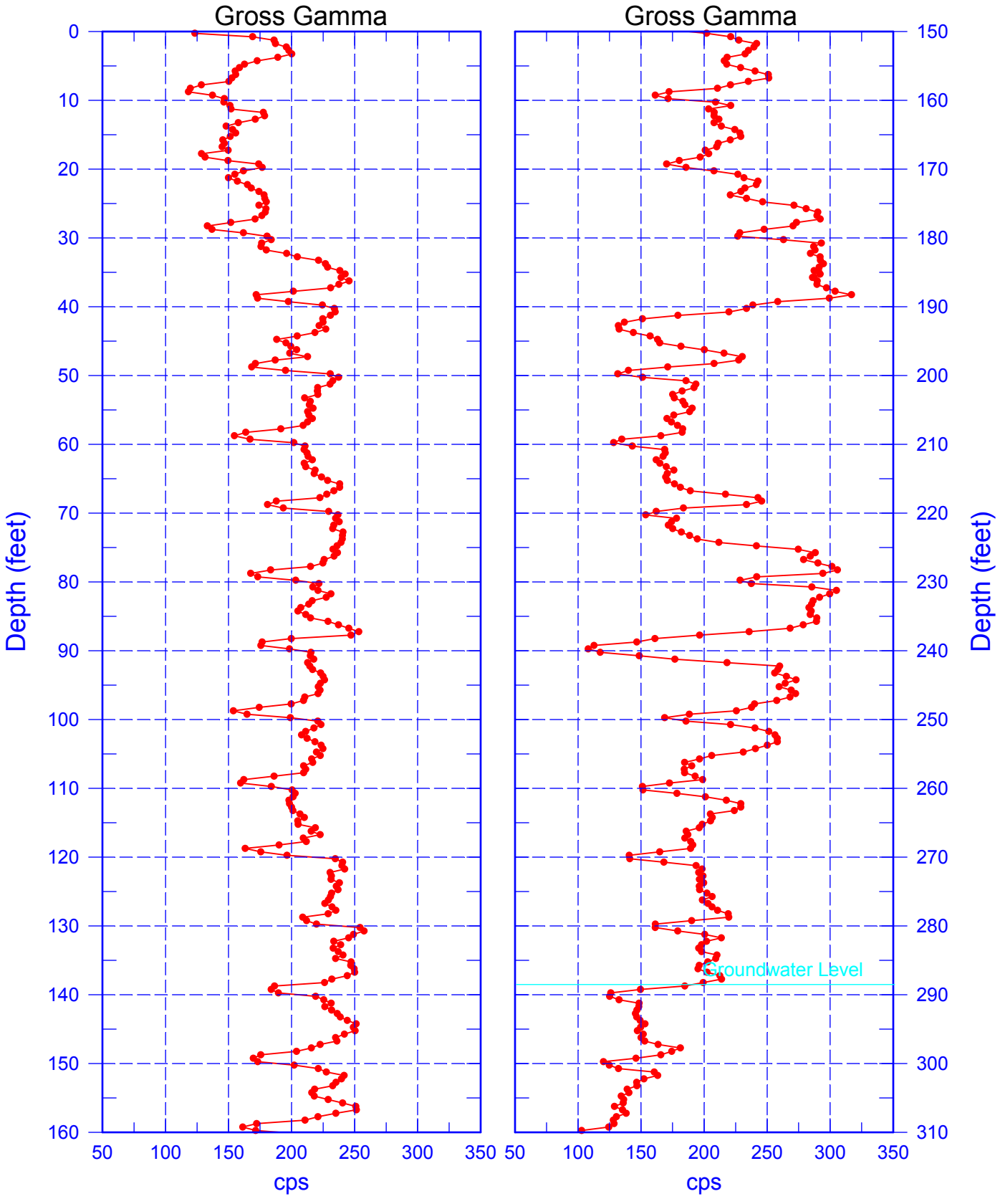
[1] GWL – groundwater level
[2] TOC – top of casing
[3] N/A – not available
[4] n/a – not applicable

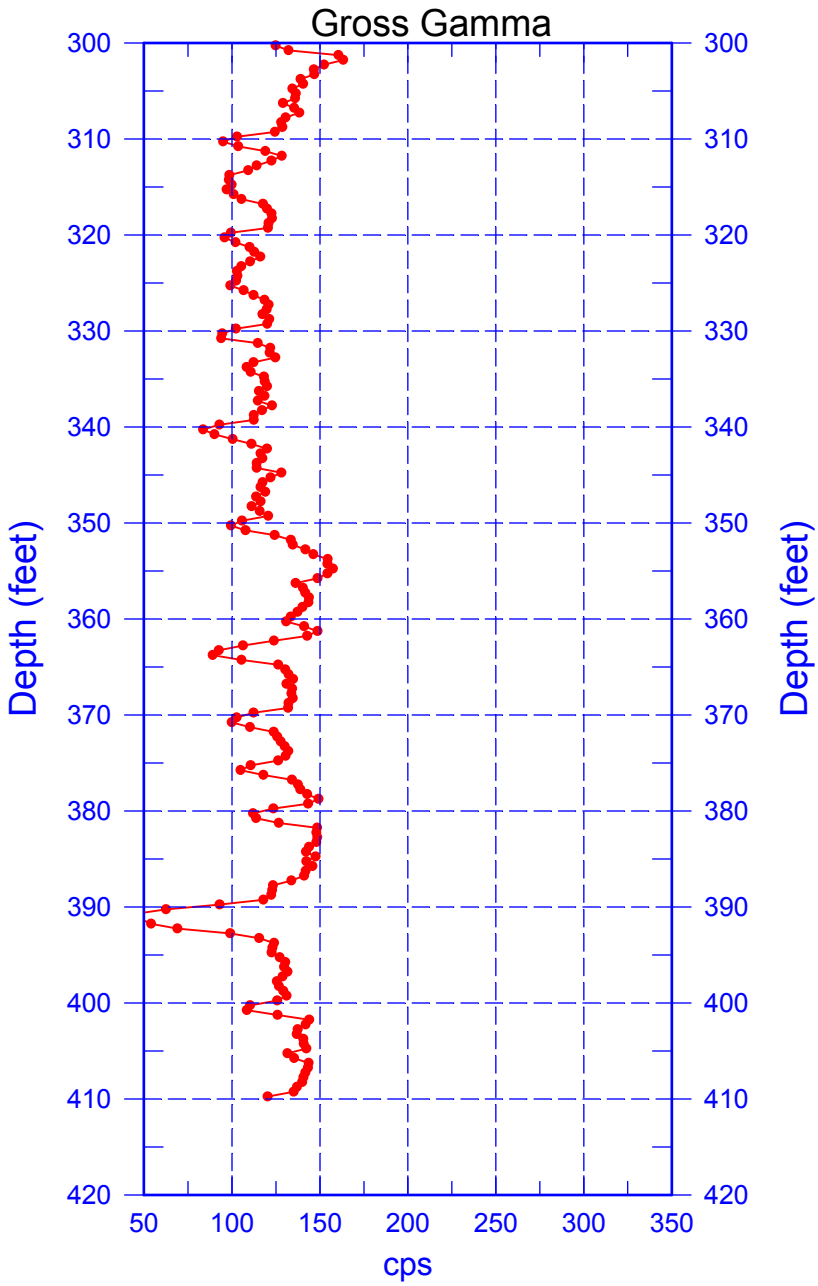
C4236



Zero Reference = Ground Surface

Date of Last Logging Run
02/11/04

C4236



Zero Reference = Ground Surface

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Repeat of Gross Gamma Log (138.0 to 179.0 ft)